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State Crop Pest Commission OF LOUISIANA.

CIRCULAR No. 12.

March, 1907.

The Circulars of the State Crop Pest Commission are sent free of charge to all farmers and fruit growers of Louisiana who make application therefor.

REPORT ON THE NURSERY INSPECTION WORK OF THE STATE CROP PEST COMMISSION FOR THE SEASON OF 1906-07.

BY WILMON NEWELL AND ARTHUR H. ROSENFELD.

One of the most important lines of work conducted by the Crop Pest Commission is that of preventing the introduction of dangerous insect pests into the orchards of our commercial fruit growers and farmers. Nursery stock is the vehicle upon which the majority of our worst fruit enemies obtain access to the orchard, and the importance of having the nurseries free of disease and deadly insect enemies must be self-evident to every thinking fruit grower.

The present report upon the nursery inspection work conducted during the past year is submitted for the joint purpose of familiarizing the fruit growers with what is being accomplished for their protection and placing in their hands information which will enable them to the more thoroughly co-operate with the Commission in protecting themselves and incidentally the State's important fruit interests.

As the present paper is the first report made upon this branch of our work, it may not be out of place to first explain, briefly, the purpose and objects of the Commission's regulations governing the sale and shipment of nursery stock in Louisiana.

The State Crop Pest Commission was established by the Extra Session of the Legislature of 1903, and in March, 1905, the nursery inspection regulations were put into effect. Louisiana was very late in securing this protection, and had already suffered severely from her lack of it. Unscrupulous nurserymen in many states, which already had inspection laws, when they found they could not legally sell diseased and insect-infested stock in their own states, shipped it at bargain prices to those states not having such laws. Our State received many thousands of these sorts of trees, and a great many species of injurious insects and diseases entered Louisiana, which might have been prevented from coming in had our State Crop Pest Commission, or something of the same nature, been established sooner. Besides saddling our orchardists with all these inferior trees, the lack of a nursery inspection law also greatly handicapped the nurserymen of our State. On account of lack of inspection and certification by a competent entomologist, our nurserymen were prevented from shipping into many states from which they might have been drawing a splendid revenue.

Since the adoption of the Commission regulations governing the sale and shipment of nursery stock, however, nursery conditions have changed greatly in Louisiana, our nurserymen now being able to ship anywhere they wish, and our fruit growers getting stock in much better condition than formerly. We can best illustrate this improvement of conditions by comparing our first year's work with that of the current season—the second inspection season.

This season we have inspected fifty-five nurseries—just twenty-seven more than were inspected last season, or lacking just one of being twice as many. Here in itself is indicated a decided improvement. In the case of sixteen out of this fifty-five, San Jose scale was found either in the nurseries themselves or so close as to endanger the nursery stock by spreading, while chaff scale on orange was found in one. To date all except five nurserymen have followed the directions of the Commission and have succeeded in eradicating the scale from their premises. In the case of the delinquent five, certificates of inspection have been refused until the premises are thoroughly cleaned up, kept under quarantine a sufficient time, then reinspected, and

pronounced apparently free of scale by the inspector. Fifty certificates of inspection have been issued—nearly twice the number issued last season.

The names and addresses of the Louisiana nurserymen holding valid certificates are given in a table on a subsequent page, and to this table the reader is referred for further details regarding the amount and kind of stock grown by each nurseryman.

Since this inspection system was inaugurated in the season of 1905-06 the amount of nursery stock grown in the State has increased almost four hundred per cent. Last season the inspectors of the Commission examined 683,550 growing marketable trees and shrubs, whereas this season the number has been increased to 2, 207,319.

On the whole the status of the nursery business of the State is most encouraging. The extraordinary increase of salable stock in the one season, the increased number of nurseries inspected, and the diminution in percentage of nurseries infested, all point to the fact that the protection and assistance given by the Commission to both buyers and sellers of nursery stock, has had the effect of materially stimulating the State's fruit industries.

THE NURSERY INSPECTION REGULATIONS.

The provisions of the nursery inspection regulations are in brief as follows: Every nursery doing business in the State must be inspected at least once each year, and, if found apparently free of dangerously injurious insects and plant diseases, the nurseryman is granted a certificate of inspection which entitles him to do business until the first of the following July, on which date the nursery inspection season ends each year. Copies of this certificate of inspection are printed upon ordinary shipping tags, and at least one of these tags must be attached to every bundle, bale, or package of nursery stock shipped or delivered within the State. As regards outside nurserymen shipping into Louisiana, certificates of inspection from the State Entomologists of their states are accepted in lieu of our tags.

These tags, besides being a great protection to both buyers and sellers of nursery stock, are also a great advertisement for

the nurserymen, as their presence upon a nurseryman's shipments are the best possible indication that the stock to which they are attached is apparently free from the dangerously injurious insects and plant diseases of which fruit growers are so much afraid.

The manner of paying for this inspection in Louisiana is far superior to that in a good many other states, inasmuch that everything here is free to the nurseryman. In Virginia, every nurseryman, resident or non-resident, has to pay twenty dollars for the privilege of doing business in the State, in Illinois nurserymen have to pay actual cost to the State for inspecting their places, and in Michigan, besides a license fee of five dollars, each nurseryman must give bond for a thousand dollars with the condition that no stock will be sold unless inspected and fumigated. Idaho also requires the deposition of a bond to the amount of one thousand dollars.

The only expense to which a Louisiana nurseryman is put by the nursery inspection law, is the very nominal one of having copies of his certificate of inspection printed upon shipping tags, the tags themselves being paid for by the Commission.

All citrus stock shipped within or delivered in the State of Louisiana must be defoliated. The regulation is aimed directly at the white fly, the larvæ of which occur only on the leaves of its host, so that by defoliation the amount of white fly infested stock is reduced to a minimum.

The insects and plant diseases declared by the Commission to be dangerously injurious to fruits are the San Jose scale, nematode root knot, cottony cushion scale, West Indian peach scale, chaff scale, woolly aphis, white fly, crown gall and hairy root diseases, and black knot; and the Commission is empowered by law with authority to add to or extend this list at any time the interests of the State require it.

THE SAN JOSE SCALE.

This is the insect which above all others is responsible for the nursery inspection laws and regulations in nearly every state in the Union. It was first introduced into this country from China, about 1870, the point of introduction being San Jose, Cal., hence its common name. From this center of infestation

it has spread almost incredibly, until now every fruit-growing state in the Union is more or less badly infested. It was first discovered in the East at Charlottesville, Va., in 1893, and although heroic measures for its extermination were taken by both the State and National Governments, their efforts were unavailing, and the pest continued its march of destruction, leaving trouble and discouragement in its wake. The San Jose scale is now a permanent factor in our orchard and nursery work, and, while we have now learned to control it quite easily in the orchard, its presence in a nursery still causes a great deal of trouble.

Many of this family of scale insects are notably injurious on account of their peculiar anatomy and habits. They cannot be poisoned because they obtain their sustenance by inserting their long, thin beaks into the tissues of the plant, and sucking the sap. All insects which feed in this manner are more difficult to control than insects feeding on the outer tissues of a plant. The question of controlling the San Jose scale, therefore, naturally resolves itself into the use of "contact insecticides," substances which, when made to touch the insects, by corroding the essential body tissues of the animal or by exerting a smothering effect, cause death. Here again the question is complicated because the insect is wholly covered during almost its entire existence, by a waxy scale, which is very resistant to almost all ordinary "contact insecticides." By many years of work, however, the wash known as the lime-sulphur wash has been developed to a high point of efficiency, and is almost universally used in controlling the San Jose scale in orchards. When it is found in a nursery, however, or very close to one, destruction of all infested plants is insisted on. Even though we can kill almost all of the insects by spraying with the lime-sulphur wash, we cannot totally eradicate them, which is the object sought in case of a nursery infestation.

We will not occupy any more space with the description of this insect, except to mention one particular peculiarity. This lies in the manner of reproduction; instead of laying eggs as most insects do, the female San Jose scale brings forth its young alive. Circular No. 4 of the Commission, which fully describes the insect and treatment for it, can be had, postage prepaid, by applying to Wilmon Newell, Secretary, Baton Rouge, La.

NEMATODE ROOT KNOT.

These knots are not caused by real insects, but by little worms belonging to another group of animals. They sometimes do quite a little damage on roots of plants, causing numerous wart-like swellings or galls. When these animals are found in a nursery, the nurserymen are to destroy all trees found infested with this parasite when the trees are being dug.

COTTONY CUSHION SCALE.

The cottony cushion scale is another one of the scale insect family, but, fortunately, one which we have not yet with us. It is known in the United States in California and Florida. This insect is to citrus trees what the San Jose scale is to deciduous trees. It is a much larger insect than the San Jose scale, white, and with the wax arranged in a peculiar fluted manner, suggesting the common name of fluted scale. As in the case of the San Jose scale, it is a foreign insect, and the point of introduction into this country was California. About 1868 or 1869 is believed to be the date of its introduction. It soon attracted widespread attention and for a while it was thought that the culture of oranges and lemons in California would have to be forsaken. However, in 1888, Mr. Alfred Koebele, an entomologist, was sent to Australia to study the natural enemies of this insect, as in its own home it seemed to be held in check by some natural enemy. Fortunately for California, and probably for the rest of the orange-growing states as well, Mr. Koebele succeeded in finding the insect which kept the cottony cushion scale from being injurious to any large extent in Australia. This insect was a little ladybird beetle predaceous on the cottony cushion scale. Mr. Koebele succeeded in importing a goodly number of these beetles to California, and in a few years the danger from the cottony cushion or fluted scale had been done away with. The scale afterwards got into Florida, and was dealt with in the same way. It still exists in both states, but whenever it becomes markedly injurious in a locality, the introduction of a few of these ladybirds soon brings it under control.

WEST INDIAN PEACH SCALE.

This is a white scale insect, which sometimes does a great deal of damage to peach and plum trees, and which as yet is restricted in Louisiana to a few localities. It was first introduced into this country from the West Indies, as may be judged from its name. When it is found in or near a nursery, its eradication is insisted on before a certificate of inspection is granted the nurseryman.

WOOLLY APHIS.

The woolly aphis is a soft-bodied plant louse, which lives on apple trees. It lives both above and below the ground, but the form on the roots is the most dangerous, because harder to treat. It excretes a white, fluffy substance, looking very much like wool, which substance gives it its common name. It causes galls on the roots of the trees very much like those of the nematode root worms. When these insects are found in a nursery, the same measures are enforced as against the nematode root knot.

WHITE FLY.

White flies are among our most common and most injurious insects on citrus trees, cape jasmine, *Ligustrum*, etc. In the younger stages they look very much like scale insects, but belong to an allied family. The larvæ are found on the under side of the leaves as small, oval, whitish, scale-like bodies, which have the faculty of exuding a sweet substance called honey-dew. Certain plant organisms, known as fungi, grow in this honey-dew, and give rise to the black or smutty appearance so common on oranges and cape jasmine in this State. To prevent the spreading of this insect to the portions of the State not yet infested, the regulations of the Commission require all citrus nursery stock to be defoliated before shipment is made.

A comprehensive article upon the habits of the white fly, and its control, has been prepared and copies may be had on application to the Secretary of the Commission at Baton Rouge.

CROWN GALL AND HAIRY ROOT DISEASES.

Almost all orchardists are familiar with the appearance of the disease known as crown gall or root knot. This is not caused by an insect, but is a plant disease. Plants affected with the hairy root disease send out at the crown a tremendous number of fibrous roots, which are distinctly noticeable as soon as the tree is dug. Plants affected with the true crown gall form a large knot right at the crown, which may vary, according to the size of the tree and stage of the disease, from an inch or so in diameter to a knot twice the circumference of the tree, or more. Nurserymen are prevented from sending out trees infected with this disease in the same manner as they are prevented from sending out trees infested with nematodes or woolly aphids. Any stock sent out infected with crown gall, nematode root knot or woolly aphids is subject to confiscation.

BLACK KNOT.

This is a disease on plum and cherry trees, which manifests itself by large knots upon the limbs, which knots increase in size year to year, gradually sapping the vitality of the tree. These knots are caused by a fungus. When trees affected with black knot are found in a nursery, all knots are required cut out before a certificate of inspection is granted.

CONCLUSION.

The above are the principal insects at present most injurious to nursery stock. As time goes on it is not impossible that other insects, at present unknown, may ultimately become more injurious than any of these. Conditions are constantly changing, and with the wholesale destruction of forests and birds—two very important factors in the control of insects—it is not surprising that insects have assumed the importance which they now have. In every state and country scientists are now working on the

problem of mitigating or holding in control the ravages of our six-legged foes, and every day we learn more and more about these interesting creatures.

We want all of the farmers and fruit growers in Louisiana to come to the State Crop Pest Commission with their insect troubles. Co-operation is the great desideratum in any fight, and never more so than in this warfare against our insect foes. The Commission was established for your benefit, and will do everything possible toward that end. Every farmer and fruit grower in the State should help us in our efforts to control the dangerous insects and plant diseases of our State, and with their help, we have not the slightest doubt that our efforts will be crowned with success, and this department of our work made as effective as that of any like institution anywhere in the entire United States.

Nursery conditions were never so good as now, which shows that our people are at last beginning to realize the wonderful fruit growing possibilities of Louisiana. Never was a state better suited for such purposes. With our fertile soils and wonderful climate, which enable us to get our fruit on the market ahead of the great fruit growing states, and with the railroads each year furnishing us better marketing facilities, there is no reason why Louisiana should not take her place among the great fruit-producing states of the Union.

LIST OF LOUISIANA

SEASON OF

NAME AND ADDRESS OF OWNER.	NAME OF NURSERY.
Abele Bros., 520 Joseph St., New Orleans.....	
Alost, A., Box 39, French Market, New Orleans.....	Rose Villa.....
Bayhi, Theodore, Naomi.....	
Bechnel, Benjimin, Naomi.....	
Becker, F. X., Rampart and Lesseps Sts., New Orleans.....	
Bourgeois, Paul, Central.....	
Chauvin, Frank, Convent.....	
Chopin, Peter A., Magazine and 8th Sts., New Orleans.....	
Clingman Nursery & Orchard Co., Keithville.....	
Cook's Sons, M., 7400 St. Charles Ave., New Orleans.....	
Copeland, J. D., Taylor Station.....	
Delee, John, Teddy.....	
DeLimon. H., Metairie Ridge, New Orleans.....	Metairie Nursery.....
Eble, Chas., 106 Baronne st., New Orleans.....	
**Eichling, C. W. 3442 St. Charles Ave., New Orleans.....	
Galbreath, D., Box 1249, New Orleans.....	
Glasscock, Burrel J., Leesville.....	
**Heroman, F. W., Baton Rouge.....	
Hewett Bros., Hammond.....	
Higgins, Hardy, (col.), Naomi.....	
Holst, C., opposite Greenwood Cemetery, New Orleans.....	Magnolia Nurseries.....
Huskamp, D., 3301 St. Claude St., New Orleans.....	
James, S. H., Mounds.....	
Keep & Nelson, Station B, New Orleans.....	
Lacy, T. J. & Co., Lafayette.....	Eureka Nurseries.....
Lee, J. D., 608-610 Milam St., Shreveport.....	
McCausland, Wm., Baton Rouge.....	
McMullen, Mrs. Joe, Stonewall.....	
Metairie Ridge Nursery Co., Metairie Ridge, New Orleans.....	
Moizant, Alfred, Buras.....	
Monkhouse, John, Jewella.....	Caddo Nurseries.....
Moore, R. S., Naomi.....	Riverside Orange Grove and Nurseries.....
Munday, Mrs. S. E., Clinton.....	

NURSERYMEN.

1906-1907.

CERTIFICATE NO.	KIND OF STOCK	NUMBER OF TREES OR PLANTS
29	Ornamental.....	4,000
46	Ornamental.....	15,250
20	Orange	150
15	Orange	3,000
40	Ornamental.....	3,636
13	Pecan.....	700
12	Pecan.....	49
37	Ornamental.....	1,000
4	General Nursery.....	338,600*
24	Citrus and ornamental.....	4,900
9	Fruit	10,400
34	Fruit	2,000
26	Citrus and ornamental.....	27,680
50	Ornamental	1,220
28	Ornamental.....	
38	Pecan and orange.....	4,200
49	General nursery.....	2,550
39	Dealer in general nursery stock.....	
11	Pecan, fig and ornamental.....	112,800
31	Orange	3,000
44	Ornamental.....	3,118
36	Ornamental	3,061
8	Pecan.....	7,000
22	Pecan, fruit and ornamental.....	9,500
17	General nursery.....	10,553
5	Pecan.....	400
42	Fig	25
7	Apple.....	1,000
27	Citrus and ornamental.....	42,850
30	Orange	800
10	General nursery.....	65,062
14	Orange	10,000
35	<i>Camelia japonica</i>	500

NAME AND ADDRESS OF OWNER.	NAME OF NURSERY.
Newsham, J. A., Nashville Ave and Pitt St., New Orleans.....	Nashville Avenue Rose Gard's
Normand, J. L., Marksville.....	Hill Side Nursery.....
Otis, C. D., Lake Charles.....	Lake Charles Greenhouse and Nursery
Quinette, F. A., Station B, New Orleans...	
Randolph, M. L., Bayou Goula.....	
Reith, Frank, Jr., St. Andrew and Camp Sts., New Orleans.....	
Robinson, B. F., Ruston.....	Ruston Nursery.....
Sanders, Leon, Plain Dealing.....	Louisiana Star Nurseries
St. Mard, J., Delachaise and Saratoga Sts., New Orleans.....	Saratoga Nurseries.....
**Schindler, Jos. A. & Co., 827 Decatur St., New Orleans.....	
See, John, 630 Bartholomew St., New Orleans	
Shadow, W. R., Mansfield.....	Louisiana Nursery Co.
Steckler, J., Seed Co., Ltd., 516 Gravier st., New Orleans.....	
Stokes, Samuel and Son, Lecompte.....	
Virgin, U. J., 838 Canal St., New Orleans..	
Wicheos, B. M., Gretna.....	
Wright, Charles (col.), Lake Charles.....	**
TOTAL, 50 Nurseries.	

**Dealers in nursery stock only. Buy only from nurseries in which conditions are known to, and approved by, the State Crop Pest Commission.

CERTIFICATE NO.	KIND OF STOCK	NUMBER OF TREES OR PLANTS
25	Citrus and ornamental.....	26,050
3	Fruit and ornamental.....	4,005
18	General nursery.....	1,778
23	Pecan, Citrus and ornamental.....	12,100
21	Pecan.....	500
47	Ornamental.....	3,000
6	General nursery.....	15,900
16	Fruit.....	28,000
48	Rosebushes.....	12,000
45	Dealers in general nursery stock.....	
33	Ornamental.....	500
2	General nursery.....	1,398,000
32	General nursery.....	265
1	Ornamental.....	14,300
41	Ornamental.....	1,750
43	Citrus and ornamental.....	90
19	Citrus and ornamental.....	77
	TOTAL.....	2,207,319

*This is really the largest nursery in the State, but the inspector failed to list ornamental stock, etc. The amount of nursery stock grown here is probably in the neighborhood of a million and a half plants.

In the above list, under "Number of plants" is given only what is known as "nursery stock," i. e., such plants as fruit trees, Cape Jasmine, field-grown rose bushes, *Ficus*, etc., which are salable. Greenhouse plants are not counted as nursery stock, hence the small amount of stock listed for some of the growers of ornamental stock.

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